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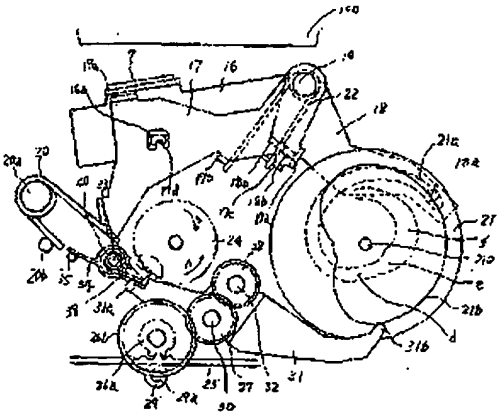
(54)【発明の名称】　インクリボン巻取装置

(57)【要約】

【構成】　インクリボンを巻取ためのギア２６と同軸となして固定ギア２４０に一部が噛み合うロック爪４４を備えたロック部材を軸ピンに回転可能に設け、ロック部材４０を固定ギア２４０側へと付勢するスプリングを同軸上に設け、ロック状態を維持されている。そして、スプリングの一端を係止している切換レバー３１の係止部が反時計方向へと回動されていると、スプリングの付勢力がロック部材に及ばなくなり、ロック爪４４と固定ギア２４０との噛み合いのみを維持する。これにより、巻取ギア２４のＡ方向の回転を可能にするものの、Ｂ方向の回転を規制し、Ａ方向に回転した後、Ｂ方向の回転のロックが解除される。

【効果】　インクリボンの巻取を行う部分が巻取方向と逆方向の回転をロックするため、インクリボンの弛みを確実に阻止でき、巻取方向の回転によりロックが完全に解除されるため、巻取方向の回転負荷もなくなる。



JP,08-207403,A ◉ STANDARD ○ ZOOM-UP ROTATION No Rotation ☐ REVERSAL RELOAD

PREVIOUS PAGE NEXT PAGE DETAIL

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] In the airline printer (printer) which uses an ink ribbon, this invention relates to the ink ribbon take-up motion which rolls round the used ink ribbon after printing while supplying this ink ribbon.
[0002]
[Description of the Prior Art] Conventionally, the laser beam printer and LED printer which used the electrophotography method in printers, such as a printer, are known, and also, generally the printer by the ribbon method which is made to transfer the ink of this ribbon to a record form, and prints it is known using the ink ribbon.
[0003] In a printer equipped with the above-mentioned ink ribbon, there are a thermal printer of the non impact method by heat, a printer of a type or an impact method with many wires, etc.
[0004] Here, in the printer using a ribbon method, after supplying from the pivotable reel which twisted the intact ink ribbon and completing printing, it is necessary to roll round using the revolution reel which rolls round this used ink ribbon. Therefore, it has the take-up reel which rolls round a used ink ribbon in one cassette to the supply reel which twisted the intact ink ribbon, and the above-mentioned take-up-reel side is rolled round and driven according to printing actuation. And if an intact ink ribbon is used, he is trying to exchange this ink ribbon cassette for a new thing.
[0005] Especially the ink ribbon cassette is prepared in the carriage which carried the thermal head with the head for printing, for example, a thermal printer, exchangeable, and the recording surface of the recording paper meets, and this carriage runs to parallel (main scanning direction), and is scanned in the direction which intersects perpendicularly with the feed direction of the recording paper. It is printing by carrying out hot printing of the ink of an ink ribbon to the detail paper with heat by pressing a thermal head through an ink ribbon on the detail paper under halt, and driving a thermal component selectively at the time of the scan of this carriage. It is made to synchronize with transit of this carriage, and the ink ribbon of an ink ribbon cassette is rolled round one by one to the machine reel side.
[0006] In this case, in the former, the device which slackens at the time of a printing halt, and locks that is, fixes a machine reel side for prevention since printing disabling or poor printing occurs because an ink ribbon slackens at the time of printing initiation is established.
[0007] As an example of the configuration of the above-mentioned lock function, various kinds of examples are specified in JP,5-24329,A. For example, what is shown in (A) of drawing 9 , (B), and (C) has the disc section 51 in the lower part of the paper winding shaft 50 which it has on the carriage with which it had the print head which is not illustrated, and the winding gear 52 is arranged on this same axle. This winding gear 52 meshed with the change-over gear 53, and the change-over gear 53 meshes with the actuation rack 54 with which the carriage which runs was independently fixed to the printer body side. By this, to carriage running in the direction of drawing Nakamigi, when printing is performed, a paper winding shaft 50 will drive the winding head 55 by which fitting is carried out to the reel in the ink ribbon cassette located in the upper part in the winding direction, and will roll round a

used ink ribbon because the change-over gear 53 rotates clockwise and the winding gear 52 rotates counterclockwise.
[0008] The above-mentioned change-over gear 53 is supported to revolve by the end of the change-over lever 56 prepared rotatable focusing on the paper winding shaft 50 pivotable at the shaft 57, and the rotating cam 58 is in contact with the edge of the opposite hand. By the revolution of this rotating cam 58, the change-over lever 56 is rotated to the location which estranges or gears especially the change-over gear 53 from the actuation rack 54.
[0009] That is, if a rotating cam 58 is in the location of (A) of drawing 9 , it will press to the platen to which the change-over gear 53 meshes on the actuation rack 54, and a print head does not illustrate the recording paper through an ink ribbon, and a record condition will be maintained.
[0010] Moreover, the end of the wire spring 59 twisted around the above-mentioned disc section 51 is stopped by two pins at the partial 56a side which the above-mentioned rotating cam 58 of this change-over lever 56 contacts, and the other end is fixed to the pin 60 by the side of the body of carriage. For this reason, the wire spring 59 is changing the paper winding shaft 50 into the free condition in the printing condition, without binding the disc section 51 tight. Therefore, if carriage runs for printing, the winding gear 52 will be rotated in the rolling-up direction through the change-over gear 53 with the actuation rack 54, and a used ink ribbon will be rolled round.
[0011] On the other hand, if a rotating cam 58 is rotated in order to cancel press of a print head after the completion of printing as shown in drawing 9 (C), the change-over lever 56 rotates counterclockwise, and therefore, a wire spring 59 binds the disc section 51 tight, and fixes that is, locks a paper winding shaft 50. Even if the change-over gear 53 is estranged and return transit (the transit at the time of printing is hard flow) of the carriage is simultaneously carried out at a home position at this time [rack / 54 / actuation], a revolution is not transmitted to a paper winding shaft 50, but a lock condition is maintained, a paper winding shaft does not rotate at the time of un-printing, and an ink ribbon does not slacken.
[0012] Moreover, the things of drawing 10 differ in the above-mentioned wire spring 59, always bind the disc section 51 tight, and constitute it in the condition. That is, it had the disc section 51 prepared in the lower part of the paper winding shaft 50 which it has on the carriage which carried the print head which is not illustrated, and the wire spring 61 is twisted around this disc section 51. The bend radii of a wire spring 61 are formed a little smaller than the radius of the disc section 51. The end of this wire spring 61 is stopped between the lock-pins 62 on carriage. Therefore, the wire spring 61 bound the disc section 51 tight for a while, and has prevented inversion prevention of a paper winding shaft 50, i.e., a revolution, by the frictional force. Therefore, the load was given to the paper winding shaft 51 by the wire spring 61, and the slack of an ink ribbon is always prevented.
[0013] What is furthermore shown in drawing 11 engages simply the inversion prevention pawl 63 and the lock pawl 64, without forming the disc section 51 in a paper winding shaft 50. That is, the lock pawl 64 is formed pivotable focusing on the supporting point 65 prepared in carriage, and a **** cage and its end 64a are stopped at the end section 56a side of the change-over lever 56, and it is making stop section 64b of the other end correspond with the above-mentioned inversion prevention pawl (ratchet) 63.
[0014] By this configuration, if it is made to rotate from the condition of drawing 11 (A) to the condition of (C) by rotating a rotating cam 58, the inversion prevention pawl 64 rotates counterclockwise, makes pawl partial 64b engage with the lock pawl 63, and locks the revolution of a paper winding shaft 50 because the change-over lever 56 rotates. At this time, the change-over gear 53 is estranged from the actuation rack 54, and maintains a paper winding shaft 50 in the nonrotation condition.
[0015] And at the time of printing actuation, a print head is pressed through an ink ribbon by rotating a rotating cam 58 to the condition of drawing 11 (A) to the recording paper. Since the change-over lever 56 rotates at this time, the inversion prevention pawl 64 can estrange from engagement section 64b, can change a paper winding shaft 50 into a free condition, and can roll round a used ink ribbon one by one to a take-up reel by the revolution of a paper winding shaft 50 in relation to transit of carriage.
[0016] As mentioned above, in the take-up motion of an ink ribbon, at the time of printing, the winding section drives in the winding direction, and since it is not generated and the winding section is locked at

the time of un-printing, the slack of an ink ribbon does not have a flabby ink ribbon.
[0017]
[Problem(s) to be Solved by the Invention] According to the lock device of each ink ribbon take-up motion explained above, since it is locked at the time of un-printing, the slack of an ink ribbon is prevented. However, if shown in drawing 10 , since the continuous-control condition, i.e., a lock condition, is maintained, it is necessary to enlarge torque for driving a paper winding shaft at the time of printing, and also becomes causing trouble to transit of carriage. In driving the shaft 50 which constitutes the winding section by making it run especially carriage using actuation rack 54 grade, it needs the big motor of driving torque. Therefore, it becomes cost high while the configuration of the printer part of a printer becomes large.
[0018] Therefore, if it constitutes as shown in drawing 9 , the fault by drawing 10 will be canceled. However, since the lock of the paper winding shaft 50 by the wire spring 59 is released at the time of the lock discharge for starting printing, there is a fear of a paper winding shaft 50 rotating. That is, the paper winding shaft 50 which is in a free condition by the effect by lock discharge, especially oscillation, etc. rotates to an ink ribbon, the winding direction, and hard flow. When an ink ribbon slackens by this and a print head is pressed by the detail paper through an ink ribbon, the cause a wrinkle etc. arises in an ink ribbon and it becomes poor printing impossible or printing is made.
[0019] moreover, even if it is the lock device of the take-up motion of drawing 11 , it is apprehensive about possibility of a paper winding shaft of rotating when a certain cause, especially engagement section 64b estrange from the inversion prevention pawl 63 since it is maintained by the free condition being high if a lock is canceled, and coming out, and an ink ribbon slackening.
[0020] Furthermore, as an energization means of the change-over lever 56 in drawing 11 , although the spring member 66 is formed in end section 56b of the change-over lever 56, the tooth space for attaching this spring member 66 is needed, and cost also becomes high at the same time the whole device is enlarged, since there are many components mark.
[0021] In addition, in drawing 9 , in order to return the change-over lever 56, if it is made to make it serve a double purpose by the wire spring 59, the energization means mentioned above will not be needed, but if the energization means for a return configuration is made to make it serve a double purpose by this wire spring 59, it becomes cost high on problems, such as the endurance of a wire spring 59, and the energization means 66 shown by drawing 11 is established anyway similarly.
[0022] In order to engage certainly the inversion prevention pawl 63 and the lock pawl 64 in drawing 11 , the lock pawl 64 Moreover, an elastic member, When constituting especially from a flat spring was desirable and it is fabricated by the flat spring, a flat spring, etc., It is difficult to fabricate pawl configuration 64b of the lock pawl 64 in a detailed configuration, and as a result, the pitch of the inversion prevention pawl 63 will also become large, and in order that whether the lock pawl 64 hits the crest of the inversion prevention pawl 63 or it gears in a trough may not have soundness, delicate lock control becomes difficult. Therefore, the slack of an ink ribbon may arise.
[0023] Moreover, with the configuration bound tight by the wire spring 59, the force in which it rotates a paper winding shaft in the direction with a bundle works, and when loosening a wire spring, the force of making the time of binding tight and an opposite direction rotating a paper winding shaft works. Namely, when a head moves to a rise condition (condition of not printing), from a head down condition (printing condition), a wire spring 59 rotates a paper winding shaft 50 in the normal rotation direction, and when moving to a down condition from a rise condition, a wire spring 59 rotates a paper winding shaft 50 in the inversion direction. Therefore, the slack of an ink ribbon surely arises.
[0024] Then, when a wire spring 59 twisted and a direction was made into reverse, it became actuation of the reverse, the force occurred in the direction which loosens the ribbon rolled round in 1 cycle actuation of a turning-the-head-up down, and there was a trouble which spoils an original function.
[0025] Moreover, in the thermal printer, it was with hot printing printing recorded on the recording paper which is a regular paper using an ink ribbon, and sensible-heat printing whose recording paper itself is a thermosensitive thing, in order that there might be no need of changing the thrust of a print head and rolling round a ribbon in sensible-heat printing, transfer of the driving force for rolling round a

ribbon was separated, and the switch of the head thrust as hot printing printing was omitted. Therefore, there was a problem to which a head push pressure cannot be changed according to the quality of transferred paper, a print speed, and the other activity about ribbon rolling up.
[0026] This invention is establishing the device which regulates a revolution of it and an opposite direction, although a revolution of the winding direction is especially attained at least into this winding part in view of an above-mentioned point at the time of lock discharge of the winding part of an ink ribbon, and it aims at preventing the slack of an ink ribbon certainly.
[0027] Moreover, it aims at simplifying the configuration of the lock device part for attaining the above-mentioned object of this invention.
[0028]
[Means for Solving the Problem] In order to attain the above-mentioned object, the ink ribbon take-up motion of this invention In the ink ribbon take-up motion equipped with the feed zone which supplies an ink ribbon to a print head, and the rolling-up section which rolls round the used ink ribbon used by printing when pressing and printing a print head on the detail paper through an ink ribbon The holddown member which regulates a revolution to the member which rotates the rolling-up section which rolls round the above-mentioned used ink ribbon is prepared. It has the lock pawl which engages with this holddown member and locks a revolution of the winding direction and hard flow. Have the lock member prepared pivotable and it has the energization member energized in the direction which makes a lock pawl this lock member engage with the above-mentioned holddown member. A lock pawl is energized to the above-mentioned holddown-member side in the above-mentioned energization member at the time of non-pressing actuation of the above-mentioned print head. A part of above-mentioned energization member is prepared possible [engagement in the device interlocked with press actuation of the above-mentioned print head] so that the energization condition by the above-mentioned energization member may be canceled at the time of press actuation of a print head. The above-mentioned lock pawl engages with a holddown member in the condition that the energization force by the above-mentioned energization member does not act, and it is characterized by locking a revolution of the winding direction of an ink ribbon, and hard flow.
[0029] It is made to wind around the shaft which can prepare an energization member pivotable [a lock member] in the above-mentioned equipment.
[0030] Moreover, the ink ribbon take-up motion of this invention which attains the above-mentioned object In the ink ribbon take-up motion equipped with the feed zone which supplies an ink ribbon to a print head, and the rolling-up section which rolls round the used ink ribbon used by printing when pressing and printing a print head to a detail-paper side through an ink ribbon The displacement member interlocked with press or un-pressing by the side of the recording paper of the above-mentioned print head, The change-over lever on which an end comes to have the member which delivers the revolution of the winding section of the nothing above-mentioned ink ribbon are rockable in contact with the above-mentioned displacement member, It is in the condition that have a holddown member for regulating the revolution of the above-mentioned winding section, and the lock member which engages with this holddown member and locks the revolution of the winding section, this lock member was interlocked with the splash of the above-mentioned change-over lever, and the above-mentioned print head was pressed to the recording paper side. And when the winding section rotates in the direction which rolls round an ink ribbon, it considers as the description arranged so that the ink ribbon winding section may be deserted.
[0031] In the above-mentioned equipment, in a lock member, it has the energization member which energizes this lock member to the above-mentioned holddown-member side, and this energization member energizes a lock member at the time of un-pressing [of a print head], and the end is stopped by the above-mentioned change-over lever so that energization may be canceled at the time of press.
[0032] In the above-mentioned equipment, the lock member was prepared pivotable on the shaft which prepares the energization member which energizes a change-over lever in the direction which contacts a displacement member, and the same axle, and has prepared the above-mentioned energization member in this shaft.

[0033]
[Function] When not performing record by the print head by the above configuration according to the ink ribbon take-up motion of this invention, a lock member engages with the holddown member for regulating the revolution of the winding section of an ink ribbon. In this case, a print head is interlocked with the actuation estranged from the recording paper, the lock pawl of a lock member is pressed by the energization force of an energization member in the direction of a holddown member, and a lock pawl engages with a holddown member. Thereby, a revolution of the rolling-up direction and hard flow is locked, and the slack of an ink ribbon is lost.
[0034] And if a print head is pressed at a recording paper side in order to print, this will be interlocked with and energization by the energization member of the above-mentioned lock member will be canceled. Even if a revolution of the winding direction and hard flow is made for the winding section of an ink ribbon at this time, only by the energization condition of the above-mentioned energization member of a lock member being canceled, association with a lock pawl and a holddown member is not canceled, but locks the revolution of that direction. Then, if the winding section makes it rotate in the winding direction, since energization of a lock member is canceled by starting printing to the recording paper, a lock member rotates in the direction which a lock pawl estranges from a holddown member. Therefore, since the winding section is in a lock condition until printing is started, while the slack of an ink ribbon is canceled, a lock member does not serve as a revolution load at the time of winding, but the small driving means of running torque is established, and an ink ribbon can be rolled round.
[0035] Here, by preparing the energization member of the above-mentioned lock member in the revolving shaft of this lock member, an arrangement tooth space is lessened and the miniaturization of equipment is enabled.
[0036] Moreover, according to the ink ribbon take-up motion of this invention, by making a change-over lever rock by the displacement member interlocked with the detail paper in a print head press or un-pressing, when performing rotational transfer or rotational un-transmitting in the ink ribbon winding section, the revolution of the winding section is not transmitted by the change-over lever at the time of un-pressing [of a print head]. A lock member engages with the holddown member which regulates the revolution in the winding section at this time. Therefore, a revolution of the winding direction and hard flow is locked in a lock member. This does not produce the slack of an ink ribbon.
[0037] Then, if a print head is pressed in order to print, the transfer of the revolution of the winding section will be attained by the change-over lever. However, the condition that the lock member engaged with the holddown member is maintained. Therefore, a revolution of the rolling-up direction and hard flow is locked, and the slack of an ink ribbon can be prevented. Then, when the winding section rotates in the winding direction of an ink ribbon by printing being started, a lock member is estranged from a holddown member. Since a revolution of the rolling-up direction and hard flow is attained and the load of the rolling-up section is lost by this, rolling up becomes possible even if running torque is small.
[0038] While being able to perform certainly the lock condition at the time of un-printing by preparing an energization member especially in a lock member, and making a holddown member energize, alienation of the holddown member of a lock member is enabled by carrying out energization discharge of this energization means by the change-over lever.
[0039] Moreover, an arrangement tooth space can be dramatically lessened by preparing the above-mentioned lock member in the shaft which prepared the 2nd energization member which makes a change-over lever contact a displacement member, and preparing the energization member of a lock member in it. Therefore, the miniaturization of equipment is enabled and it can contribute also to cost reduction.
[0040]
[Example] Drawing 1 and drawing 2 are the plans showing the device of the ink ribbon take-up motion with which the printer in this invention is equipped, in order that drawing 2 may roll round an ink ribbon for the condition of maintaining in order that drawing 1 may prevent the slack of an ink ribbon, the lock condition, i.e., the fixed condition, of a winding part of an ink ribbon, the lock of an ink ribbon paper winding shaft is canceled, and the revolution is made possible in the winding direction.

[0041] Moreover, the carriage of a printer equipped with the ink ribbon take-up motion shown in this drawing 1 and drawing 2 is as the perspective view showing the printer unit of a printer in drawing 3 , and is shown in a sign 1. Carriage 1 is formed movable in accordance with the slide shaft which is not illustrated. The recording paper is inserted from the insertion opening 4 formed between the delivery roller 2 and a guide 3, and the delivery roller 2 is sent into it by hand control or the revolution of a drive motor which is not illustrated in a printing location.
[0042] A revolution of a drive motor is transmitted through the gear on which actuation gear 2b is being fixed to by the end of side frame 5a of a printer unit, and revolving-shaft 2a supported to revolve pivotable at the 5b side in both sides, and the above-mentioned delivery roller 2 gears with this gear 2b. The platen which is not illustrated to shaft 2a of this delivery roller and parallel is arranged in the printing location. The platen is arranged so that it may be located in the tooth back of the detail paper pinched and sent with the delivery roller 2 and the follower roller 6, and the detail paper is pressed through an ink ribbon to a platen at the time of press of the print head 7 on carriage 1.
[0043] The slide shaft which was mentioned above to the above-mentioned platen and parallel and which is not illustrated is arranged, to carriage 1 running in accordance with this slide shaft, a print head 7 is pressed to a platen and sequential record of the image of a request on the recording paper is carried out through the ink ribbon which is not illustrated.
[0044] Two pivotable koro 8 is formed in the opposite hand the print head 7 side of a slide shaft, and this carriage 1 is held on flection flat-surface 9a in which the bottom frame 9 of a printer unit was pushed on, and this koro 8 bent and was formed, and moves through the koro 8 in a flection flat-surface 9a top in accordance with a slide shaft.
[0045] The drive for transit of this carriage 1 is transmitted to a timing belt 11 through the gear which is each means of communication by revolution of the carriage motor 10, this a part of timing belt 11 is fixed, and carriage 1 runs in accordance with a slide shaft, as mentioned above. The above-mentioned timing belt 11 is formed in the both sides which carry out carriage transit pivotable at the bottom frame 9, it is laid between tie MINGIYA 12a and 12b, and the timing belt 11 by the side of the delivery roller 2 is being fixed to carriage 1.
[0046] Furthermore, the feed zone 14 holding the reel for supplying the ink ribbon in the detection sensor 13 for performing the print head 7 for printing and termination detection of an ink ribbon and an ink ribbon cassette and the ribbon winding section 15 for rolling round the used ink ribbon in this invention are formed in carriage 1. Each reel of an ink ribbon cassette fits in, and this ink ribbon cassette is prepared removable so that it may be in agreement with each head section of the feed zone 14 on carriage 1, and the winding section 15. This carriage 1 is lid 1a with the removable upper part, and if this lid 1a is removed, the press device of a print head 7 shown in drawing 1 and drawing 2 and the actuator of a paper winding shaft are held.
[0047] Next, the detail of the ink ribbon take-up motion of this invention is explained based on drawing 1 and drawing 2 .
[0048] In drawing 1 , the cam lever 18 for controlling the press condition of the press member 17 for the interior of carriage 1 to press the head holder 16 which comes to fix a print head 7 on the carriage base 1b, and this head holder 16, and the press member 17 is first supported by the same axle 19 pivotable, respectively. The energization force in which the end of the spring 20 which is the energization means wound around axial pin 20a by which the above-mentioned press member 17 was formed on carriage base 1b is stopped, and always energizes a print head 6 in the direction of a platen is given. The other end of this spring 20 is stopped by stopper section 20of carriage base 1b b.
[0049] Moreover, in order to carry out position control of the condition of a cam lever 18 resisting the energization force of the spring 20 always energized in the direction of a platen, and pressing a print head 7 to a platen 100 in a printing location and a non-printing location, and the condition of not pressing It is inserted in cam-groove 21a currently formed in the revolution actuation cam gear 21 centering on the shaft 210 used as the support part 19 and the medial axis of the feed zone 14 which pin 18a prepared in the opposite hand mentioned above. This cam lever 18 and the above-mentioned press member 17 can be stopped between bending section 18b and stop section 17a.

[0050] The spring 22 is wound around the above-mentioned pivot 19. the end of this spring 22 intervenes between 2nd box pars-convoluta-lobuli-corticalis-renis 18of bending **** c corresponding to a cam lever 18 side with the above-mentioned bending section 18b, and is stopped. And the other end of a spring 22 is stopped by 2nd box pars-convoluta-lobuli-corticalis-renis 17b formed in the press member 17. Especially the stop part by the side of the cam lever 18 of a spring 22 is stopped among both the bending sections 18b and 18c mentioned above so that it may become the physical relationship which can be stopped also to 2nd folding section 17c of the press member 17.
[0051] Therefore, if a spring 22 is stopped by 2nd box pars-convoluta-lobuli-corticalis-renis 17c, it will be in the condition that bending section 18b of the above-mentioned cam lever 18 and stop section 17a of the press member 17 are stopped, the revolution of a cam lever 18 will be interlocked with, and the press member 17 will rotate to rotation, i.e., coincidence. In this interlocking the press member 17 in this direction, and making it rotate, when a cam lever 18 rotates counterclockwise in drawing, and rotating clockwise, the press member 17 performs energization which the rotation force acts and presses the head holder 16 to a platen side according to the energization force of a spring 20.
[0052] Furthermore, the operation whose energization force of a spring 22 the end of a spring 22 will estrange from 2nd box pars-convoluta-lobuli-corticalis-renis 17c if it is in the condition that the print head 7 was pressed to the platen 100 side and a cam lever 18 rotates further, and presses the press member 17 to a platen 100 side further will be promoted together with a spring 20, and a print head 7 will be further pressed to a platen 100 side.
[0053] And when 17d of bending sections mostly formed in the center section is inserted in opening 16a currently formed in the head holder 16 and 17d of bending sections stops the press member 17 and the head holder 16 to opening 16a by this, they are the configuration that both interlock. However, it becomes possible to rotate the head holder 16 according to an above-mentioned interlock in the condition that are pressing the head holder 16 and head 7 part and the above-mentioned location 17e have estranged especially, in the print head 7 of the press member 17, and corresponding location 17e.
[0054] The cam gear 21 has geared with the actuation gear fixed to the revolving shaft of the cam action motor by which a means to rotate the above-mentioned cam gear 21 was formed in the lower part of carriage base 1b, and which is not illustrated, and revolution actuation control of the cam gear 21 is carried out by revolution of this motor at a clockwise rotation or a counterclockwise rotation. this actuation -- setting -- a print head 7 -- a cam lever 18, the press member 17, and the head holder 16 -- minding -- a platen 100 side -- press -- or it will be un-pressed.
[0055] The displacement member consists of motors which carry out revolution actuation of the above-mentioned head holder 16, the press member 17, a cam lever 18, the cam gear 21, and this cam gear 21.
[0056] Shaft 21a of the above-mentioned cam gear 21 is the medial axis of the feed zone 14 arranged on lid 1a of the carriage 1 mentioned above, regulated the revolution of the supply reel in an ink ribbon cassette with the spring which especially the feed zone 14 was formed in lid 1a of carriage 1 pivotable, and intervened between lid 1a, and has prevented the slack of an ink ribbon. And the insertion hole for axial insertion is formed in the shaft 210 and the corresponding location, and a feed zone 14 is arranged so that a feed zone 14 may be inserted along with the insertion hole.
[0057] It was fixed to the penetration shaft 23 in which it is prepared pivotable to the paper winding shaft 22 prepared on carriage base 1b corresponding to [as the winding section 15 which separates predetermined spacing corresponding to the above-mentioned feed zone 14, and is arranged is shown in the sectional view of drawing 4] above-mentioned shaft 21a, and winding head 14a was prepared pivotable on a shaft 22, gets down, and is prepared pivotable to this penetration shaft 23.
[0058] And the winding gear 24 prepares through friction member 23a to the penetration shaft 23 pivotable, spring 24a intervenes between the upper part of a **** cage and the winding gear 24, and the underside of winding head 15a, and the revolution of the winding gear 24 is transmitted to feed zone head 15a through the penetration shaft 23. A take-up reel can be rotated by fitting of the take-up reel in the ink ribbon cassette with which the lid 1a upper part of carriage 1 was equipped being carried out to winding head 15a by this. And if the turning effort beyond the need (torque) acts, only the winding gear 24 is rotated, a revolution will not be transmitted in friction member 23a, but the revolution of the

penetration shaft 23 and winding head 15a will slip. In short, a TORIKU limiter consists of above-mentioned spring 24a and friction member 23a.
[0059] The actuation transfer device in which the above-mentioned winding gear 24 is rotated The actuation rack 25 fixed between both frame 5a of a printer, and 5b in the ends, 2nd pulley gear 26b united with gearing pulley gear 26a and this pulley gear 26a, It consists of a medium gear 27 which meshes with this 2nd pulley gear 26b, and a change-over gear 28 which meshes with this medium gear 27, and the winding gear 24 becomes pivotable because the change-over gear 28 meshes with the winding gear 24.
[0060] Especially the above-mentioned actuation rack 25 is being fixed to the timing belt 11 of the printer unit section and parallel which are shown in drawing 3 by the frame of the right-and-left ends of a printer unit. Revolution actuation of the pulley gear 26a will be carried out clockwise, and the winding gear 24 will rotate counterclockwise (the direction of arrow-head A) eventually, and, therefore, an ink ribbon will be rolled round because carriage 1 rotates in the direction of drawing Nakamigi. The pulley gear 26 which meshes on this actuation rack 25 is formed in axial pin 29a prepared in carriage base 1b pivotable, and it is [correctly and] made to ensure engagement with this actuation rack 25 by the koro 29 arranged at the tooth back of the actuation rack 25 while it guides the actuation rack 25.
[0061] The above-mentioned actuation rack 25, the medium gear 27, and the change-over gear 28 are the revolution transfer members of the winding section 15 of an ink ribbon, and the winding gear 24 is the revolution member of the winding section 15.
[0062] Moreover, the change-over gear 28 which the medium gear 27 is formed in the axial pin 32 of the change-over lever 31 and the same axle prepared in the axial pin 30 prepared on carriage base 1b pivotable pivotable, and always meshes with this medium gear 27 is formed in the axial pin 32 arranged on the change-over lever 31 pivotable. Therefore, engagement with the change-over gear 28 and the winding gear 24 will be controlled by the change-over lever 31 rotating.
[0063] Stop section 31a which the end of the spring 34 with which the end was wound around the pin 33 arranged on carriage base 1b stops is formed, and the energization force to a counterclockwise rotation is given centering on the axial pin 30 mentioned above according to the energization force of this spring 34 as the change-over lever 31 is shown in drawing 4 . The other end of this spring 34 is formed in the lock-pin 35 (refer to drawing 1) prepared in carriage base 1b.
[0064] And edge 31b of the end in which the spring 34 of the change-over lever 31 is formed, and objection contacts outside cam 21b formed in the top face of the cam gear 21 as shown in drawing 5 , and rotation control of the change-over lever 31 is carried out synchronizing with the head actuation mentioned above. That is, in accordance with the peripheral surface of outside cam 21b, the change-over gear 31 rotates centering on the axial pin 32 because the cam gear 21 rotates.
[0065] Cam-groove 21a prepared in the underside of the above-mentioned cam gear 21 has the 1st press location d and the 2nd press location e to which the thrust to a print head 7 is changed on the record location of a print head 7, and outside cam 21b which operates the change-over lever 31 synchronizing with the print head actuation mentioned above is formed in the top face of the cam gear 21. Therefore, synchronizing with performing alienation and press control of a print head 7, the revolution to a counterclockwise rotation or a clockwise rotation controls for the change-over lever 31 by the cam gear 21 rotating in the location f which makes a head estrange through the condition of drawing 1 which makes a print head 7 estrange from a platen 100, and the 1st press location d and the 2nd press location e which presses the print head 7 mentioned above to a platen 100.
[0066] When the print head 7 in the condition of drawing 1 is used for printing in the above configuration, By that is, the thing for which drawing 1 is in the condition of not printing, the motor for actuation of the cam gear 21 which is not illustrated when performing printing from this condition rotates, and the cam gear 21 is rotated clockwise Along with cam-groove 21a formed in the underside of this cam gear 20, pin 18a of a cam lever 18 is guided, and this cam lever 18 rotates clockwise. Thereby, the press member 17 is energized by the energization force of a spring 20, and it rotates so that rotation of a cam lever 18 may be followed. Thereby, the head section of the press member 17 and corresponding partial 17e press head holder 16 tooth back, and make the head holder 16 rotated to a clockwise rotation.

Thereby, a print head 7 presses the recording paper arranged through an ink ribbon at a platen 100. A print head 7 is pressed to the printing platen 100 in the condition corresponding to pin 18a of the above-mentioned cam lever 18 in the 1st press location c for this printing. This condition is shown in drawing 2 .

[0067] Therefore, the change-over lever 31 is also rotated counterclockwise and it is made to move in the direction which engages the change-over gear 28 to the winding gear 24. And the change-over gear 28 meshes with a winding gear in the condition that a print head 7 is pressed by the 1st printing location. And if carriage 1 starts migration rightward in order to print, the used ink ribbon will be rolled round one by one because both the pulleys gear 26 rotates with the actuation rack 25 and the winding gear 24 therefore rotates counterclockwise through the medium gear 27 and the change-over gear 28.

[0068] Moreover, if printing is completed, in order to estrange a print head from a platen, inversion actuation of the cam gear 21 is carried out to the condition of drawing 1 , and the change-over gear 28 is made to estrange from the winding gear 24. It is made to return, in order to carry out return actuation of the carriage 1 leftward and to perform the following line printing in this condition. Even if return actuation of the above-mentioned carriage 1 is carried out, rolling up of an ink ribbon is not performed, but the above-mentioned rolling-up gear 24 is maintained by immobilization, i.e., a lock condition, so that the slack of an ink ribbon may not arise.

[0069] In addition, if the cam gear 21 is further rotated in the state of drawing 2 and pin 18a of a cam lever 18 corresponds to the 2nd printing location e, a cam lever 18 will rotate counterclockwise and the end of a spring 22 will contact bending section 17c of the press member 17. At this time, a print head 7 is pressed by the energization force of a spring 20 by the press member 17. That is, in the 1st printing location d, the energization force of a spring 22 will also be acted and a print head 7 will be pressed to a platen 100. In this case, printing which the revolution of the winding gear 24 is suspended, for example, uses a thermal paper as the recording paper by revolution actuation also of the change-over lever 31 being carried out clockwise will be performed.

[0070] The device which locks the winding gear 24 at the time of un-printing [which was mentioned above] according to following this invention is explained below.

[0071] A lock device forms the lock member 40 in the axial pin 33 which wound the spring 34 which always gives the counterclockwise energization force for the above-mentioned change-over lever 31 pivotable. The lock member 40 has the crevice 41 which inserts the coiled form spring 39, as shown in drawing 6 . Made it relate to this crevice 41, formed the sector-like opening 42 in the part, and the stop section 43 of the above-mentioned spring 39 of a radii configuration is formed corresponding to this opening 42. Resin molding of the lock pawl 44 extended so that it might furthermore gear with the winding gear 24 and the fixed gear 240 which is the holddown member which regulates the revolution of the winding section 15 really formed is carried out in one.

[0072] A winding part is inserted in the above-mentioned crevice 41, and, as for the above-mentioned spring 39, each edge is stopped by the stop section 43 through opening 42. Therefore, the energization force of a spring 39 does not rotate the lock member 40 in the condition that the ends part is formed in the stop section 43. That is, it becomes possible to make the end of a spring 39 compress to an other end side, and to rotate the lock member 40 centering on a shaft 33 by energization of this spring.

[0073] Therefore, the lock member 40 is inserted in the axial pin 33 which supported the spring 34 which energizes the change-over gear 31 pivotable, is equivalent to the winding gear 24 which the lock pawl 44 mentioned above, and the fixed gear 240 really formed, and is arranged at the gearing physical relationship. Moreover, the location stopped the end [of the spring 39 of the lock member 40] 44, i.e., lock pawl, side is prepared by the relation to which the edge of an opposite hand corresponds with stop section 31a of the change-over lever 31. Therefore, if a clockwise revolution acts [the lock member 40] in drawing 1 , in the condition of being stopped by the stop section 31, the end of a spring 39 will carry out revolution energization of the lock member 40 counterclockwise, and will energize the lock pawl 44 to the fixed gear 240 side. However, if the change-over lever 31 rotates counterclockwise to it and reverse, a stop with a spring 39 will be solved and the lock member 40 will be having stopped with as in the locked location.

[0074] In the above configuration, the point of application of the change-over lever 31 is in contact with the major-axis side of outside cam 21b in the condition of being in the evacuation location (turning-the-head-up condition at the time of un-printing) which the print head 7 estranged from the printing location (refer to drawing 1). Therefore, the change-over gear 28 is estranged from the winding gear 24, and moves the spring 39 of the lock member 40 to a counterclockwise rotation by the change-over lever 31. Thereby, the revolution operation by the energization force of a spring 39 is received, the lock pawl 44 moves in the fixed gear 240 direction, this lock pawl 44 and the fixed gear 240 mesh, and the lock member 40 will be in a perfect lock condition to a revolution of the direction of arrow-head B of the winding gear 24, i.e., the direction where the rolled-round ink ribbon is pulled out. Therefore, if the elastic body of the lock member 40, especially the energization force of a spring 39 are overcome and the rolling-up gear 26 is rotated in the direction of arrow-head A to a revolution of the direction of arrow-head A, i.e., the direction which rolls round an ink ribbon, the fixed gear 240 overcomes the lock pawl 44 of the lock member 40, and can rotate in the direction of arrow-head A. However, it becomes the revolution to the direction which an ink ribbon does not slacken in this case and is rolled round.
[0075] Since it regulates and locks the revolution of a revolution (the direction of arrow-head B) of the winding direction of the winding gear 26, and hard flow by the lock member 40 by this configuration in not performing printing by the print head 7, it is lost that the rolled-round ink ribbon slackens. the time of being moved in order that carriage 1 may return to a home position especially at the time of termination of 1 line printing -- **** -- the print head 6 has turned up its head like (condition of drawing 1), and the ink ribbon rolled round during the transit at the time of printing does not slacken
[0076] Next, in case printing is resumed, in order for a print head 6 to make it move to the printing location on a platen (head down condition in which the head carried out the pressure welding to the platen) from a turning-the-head-up condition, revolution actuation of the cam gear 21 is carried out clockwise. Thereby, a print head 7 is pressed to a platen 100 side with a cam lever 18, the press member 17, and the head holder 16. At this time, the change-over lever 31 contacts on cam 21b outside the cam gear 21, it is moving to the minor-axis section from the major-axis section, and revolution energization is counterclockwise carried out by the energization force of a spring 34.
[0077] Thereby, if it rotates to the 1st printing location d of cam-groove 21a of the cam gear 21, the change-over gear 28 and the winding gear 24 will mesh, and the stop condition of the spring 39 of the lock member 40 and stop section 31a of the change-over lever 31 will be dispelled. Therefore, the turgescence is dispelled (the energization to fixed gear 240 direction canceled in the lock member 40), the spring 39 of the lock member 40 holds the condition that the lock pawl 44 of the lock member 44 geared [******] with the fixed gear 240, and the lock condition to the direction of arrow-head B of the winding gear 26 is continued.
[0078] Therefore, with the former, the revolution to the direction of slack of the ink ribbon of the winding gear 26 will not act at all in things at the lock member 44 at the time of the actuation to the head down direction, but a print head 7 will lock at it, and the slack of an ink ribbon does not arise at all.
[0079] Then, with printing directions, the winding gear 40 rotates in the direction (the rolling-up direction of a ribbon) of arrow-head A by migration in the printing direction of carriage 1, and, as for the lock pawl 44 of the lock member 40, engagement with the fixed gear 240 is canceled by ****** at first. That is, although the lock pawl 44 of the lock member 40 has geared with the fixed gear 240 and locks the revolution of the direction of B in the condition of drawing 2 when the winding gear 24 does not rotate As mentioned above, since the stop condition with stop section 31a of the change-over lever 31 is dispelled [the turgescence of the above-mentioned spring 39] for the end of discharge 39, i.e., a spring, by revolution of the direction of A, the lock member 40 receives clockwise revolution driving force, and it rotates in the direction. Therefore, although regulation of the revolution to the direction of B is solved, an ink ribbon is rolled round one by one by transit of carriage, and an ink ribbon does not slacken. Moreover, in order that the energization force of the spring of the lock member 40 may not reach, the torque for rolling up of an ink ribbon does not become large.
[0080] Here, in a lock member, although a lock condition is canceled when a print head is driven in the condition of a head down, the principle which performs the lock to the direction which has a flabby ink

ribbon is explained below according to drawing 7 and drawing 8 .
[0081] The case where running torque T of the inversion direction by the winding gear 24 (fixed gear 240 which meshes with the lock pawl 44 united with the winding gear 24), i.e., the direction which has a flabby ink ribbon, (the direction of arrow-head B) acts is considered first, using as P point of application of the lock pawl 44 which gears with the lock pawl 44 of the lock member 40, and the fixed gear 240 in drawing 7 . In this case, a counterclockwise turning effort is expressed with F=T/R centering on the inversion direction 33 concerning the lock member 44, i.e., an axial pin. This R is the radius of the fixed gear 240.
[0082] In the force F of the above-mentioned inversion direction, the field of the lock pawl 44 of the lock member 40 is received. The level force Fx, The distance to the point corresponding to the point of application which decomposes into the vertical force Fy and becomes parallel to the vertical force Fy direction by point of application P from the bottom of its heart during the revolution of the lock member 40 x, When distance which becomes parallel to the level force Fx from the core of the lock member 40 to point of application P is set to y, so that Fxxx+Fyxy may maintain more than "0", i.e., the relation of Fxxx+Fyxy>0 With the revolution center position of the lock member 40 to a winding gear 26 revolution center position, and the configuration of the lock pawl 44, even if there is no operation which energizes the lock member 40 to the fixed gear 240 side, a revolution of the direction and opposite direction which the ink ribbon by the winding gear 24 rolls round is locked. From the straight-line part of the center of rotation 33 of the lock member 40, and the center of rotation 22 of the fixed gear 240, if the lock pawl 44 of the lock member 40 is made for the point of gearing the fixed gear 240 to become the lower part, above-mentioned relation is especially maintainable.
[0083] On the other hand, like ****, as shown in drawing 8 , when the revolution (revolution of the direction of A) to the direction where an ink ribbon rolls round the winding gear 24 is performed, when running torque T by the hand of cut acts, the turning effort F of the clockwise rotation concerning the lock member 40 is expressed with F=T/R. And this turning effort F is decomposed into the respectively level force Fx and the vertical force Fy. When each parallel distance which is equivalent to point of application P from the core of the lock member 44 is set to x and y, When angular-moment Fxxx of the lock direction is smaller than angular-moment Fyxy to the lock discharge direction, That is, Fxxx<Fyxy When maintaining relation, the lock member 40 by the revolution to the direction of A of the winding gear 26 rotates clockwise centering on the axial pin 33, a lock condition is canceled, and the lock to the direction of B of the winding gear 26 is canceled.
[0084] Although friction with the pawl 44 and the fixed gear 260 of the lock pawl 44 in point of application P is disregarded and explained in the above explanation The location of the core of the lock member 40 and the core of the fixed gear 240 (the winding gear 26 and same axle) is received so that the relation of a formula mentioned above in short may be maintained. An above-mentioned formula can be satisfied with relation with the gearing location with the fixed gear 260 by the pawl 44, and a counterclockwise revolution can be locked in drawing by preparing the location which gears especially so that it may become the lower part of an above-mentioned center line. What is necessary is here, just to set up the center of rotation of the lock member 40, the center of rotation of the fixed gear 240, and an engagement position so that it may become the relation of above-mentioned objection in order to lock a clockwise revolution.
[0085] Moreover, when considering as the configuration which locks the winding gear 26 by the lock member 40 according to this example, engagement with the winding gear 26 and the fixed gear 260 prepared in the same axle is used. Such a configuration not a follower gear other than the winding gear 26 is prepared, the configuration which locks this follower gear 26 may be used, and if it arranges as physical relationship with this follower gear was mentioned above, the object of this invention can be attained.
[0086] In this case, even if the fixed gear 260 which meshes with the lock pawl 44 of the lock member 40 forms the gear tooth of that gear 260 very finely, it can form easily the lock pawl 44 which gears for that gear tooth. That is, if it seems that this lock pawl 44 is shown in drawing 10 of a flat-spring configuration, although the pawl for being unable to perform fine workmanship, therefore locking

becomes large and fine lock control cannot be performed, according to this invention, these are canceled and very fine lock control is enabled.

[0087] In addition, although it really forms with the resin cast as the structure of the lock member 40 by this example and the torsion coil spring (spring) is used by making this into an elastic body, as long as it acts like this, a configuration and structure may be what kind of objects.

[0088]

[Effect of the Invention] Although according to this invention a revolution of the winding direction is enabled in addition to winding actuation of an ink ribbon while the configuration of a lock member can be simplified dramatically, a revolution of this and an opposite direction can be prevented, and since a lock condition is dispelled at the time of printing initiation, the slack of an ink ribbon can be prevented thoroughly. In this case, the member which energizes a lock member can be prepared in a lock member and the same axle, arrangement tooth spaces can be reduced, and a miniaturization and low cost-ization are attained.

[0089] Since the lock location is not regulated, especially a lock member can perform very fine lock position control. That is, lock control can be made fine by making fine the pitch of the holddown member with which a lock member engages.

[0090] And since a lock member is estranged from a holddown member at the time of printing initiation, a lock member does not serve as a load but can make running torque for rolling up small.

[Translation done.]